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GB 2242737 A GB 1266131 A

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(54) Simulated real flame electric fire

(57) A simulated real flame electric fire, for general use in the domestic and office situation, comprises a means of generating the audio and visual effects necessary to create the aura associated with flames and fire by using opaque, or semi-opaque, screens 3 onto which can be projected one or more flame image sequences which have been previously recorded in real situations and thereafter stored on video tape with sound effects and then later regenerated continuously on the fire screen, or screens, by means of a video player 5, colour monitor 6 and lens or mirror optical system 7, 8. The fire may include a plurality of screens (Figure 2) to create a 3-D effect. There may also be included means to release fragrances to impart the olfactory sensation of log burning.

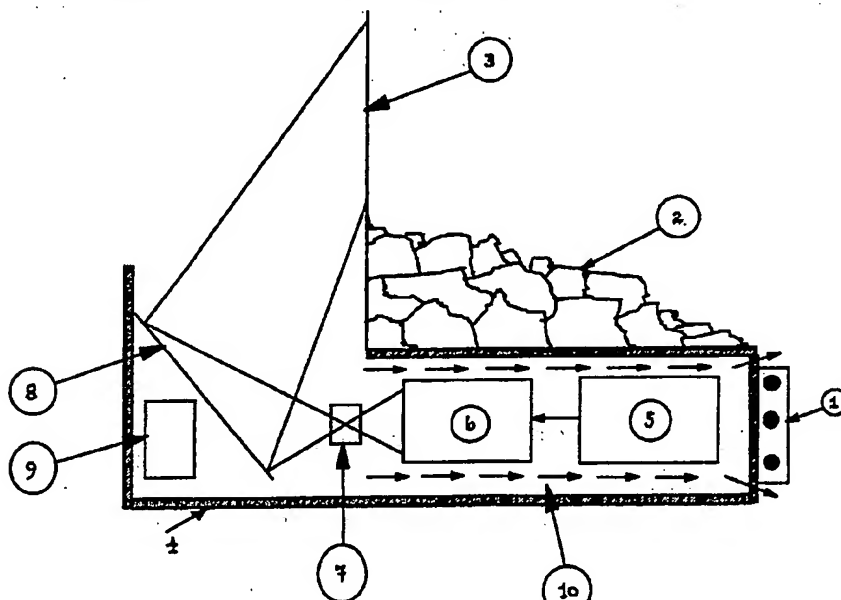


Fig. 1.

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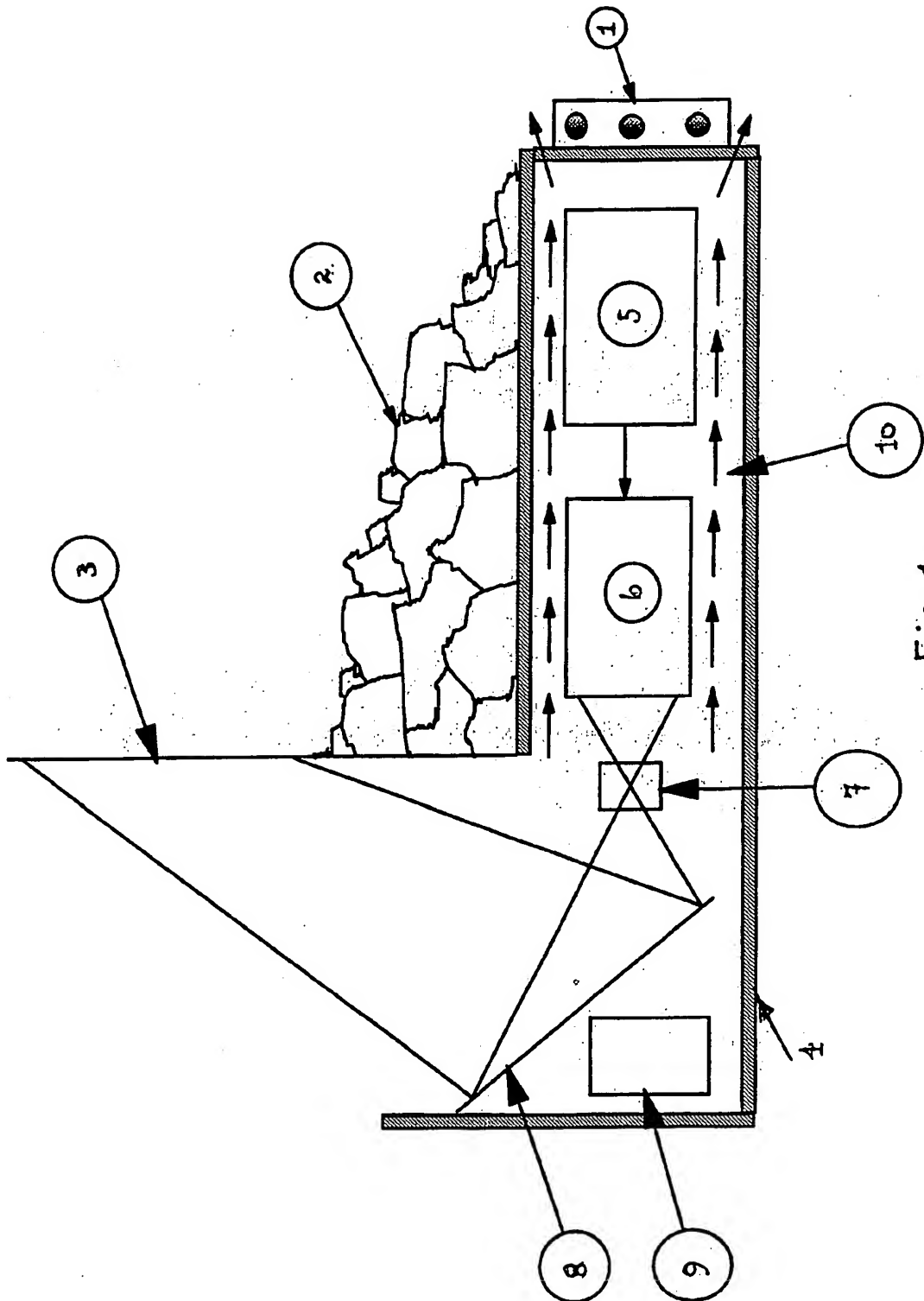


Fig. 1.

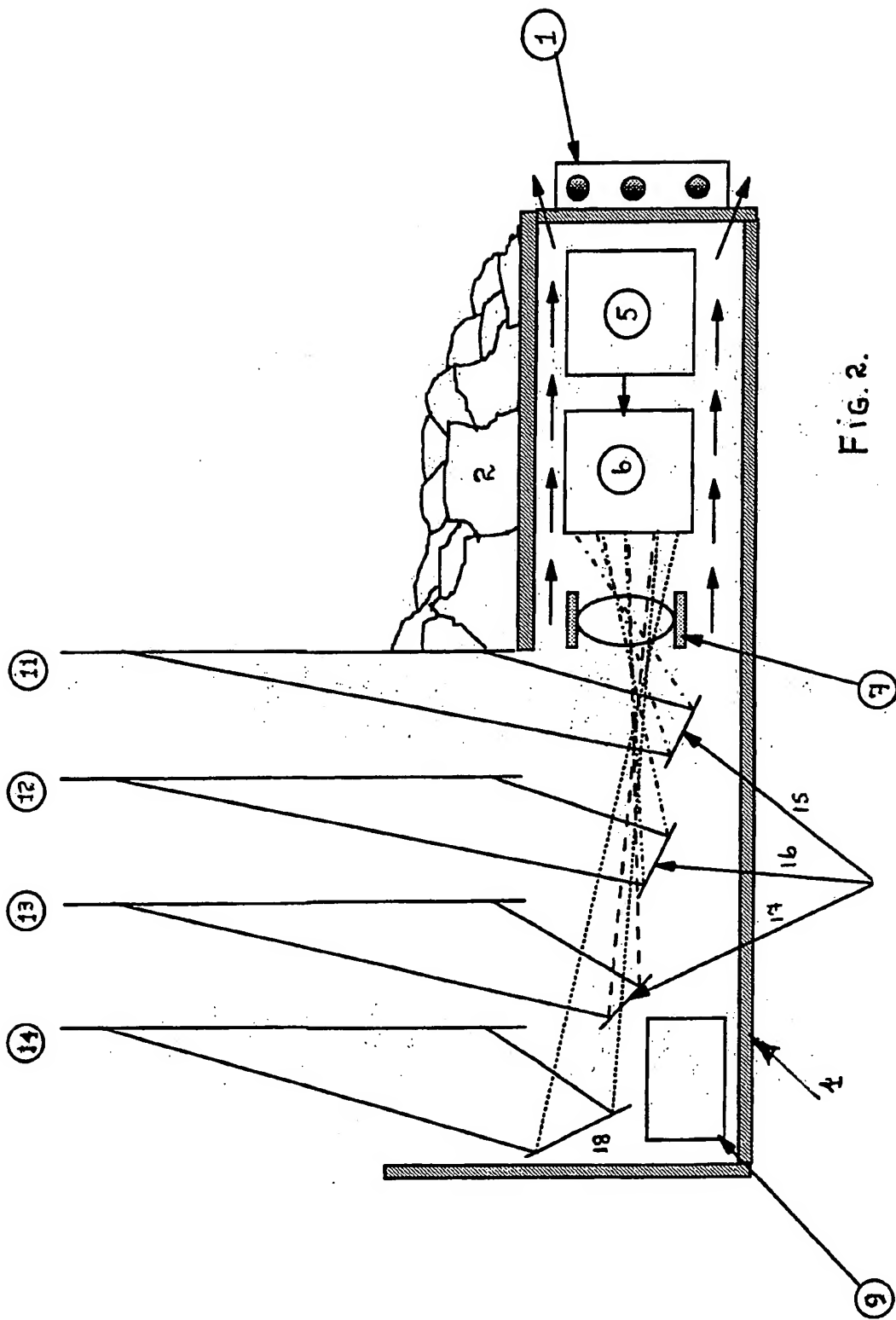


Fig. 2.

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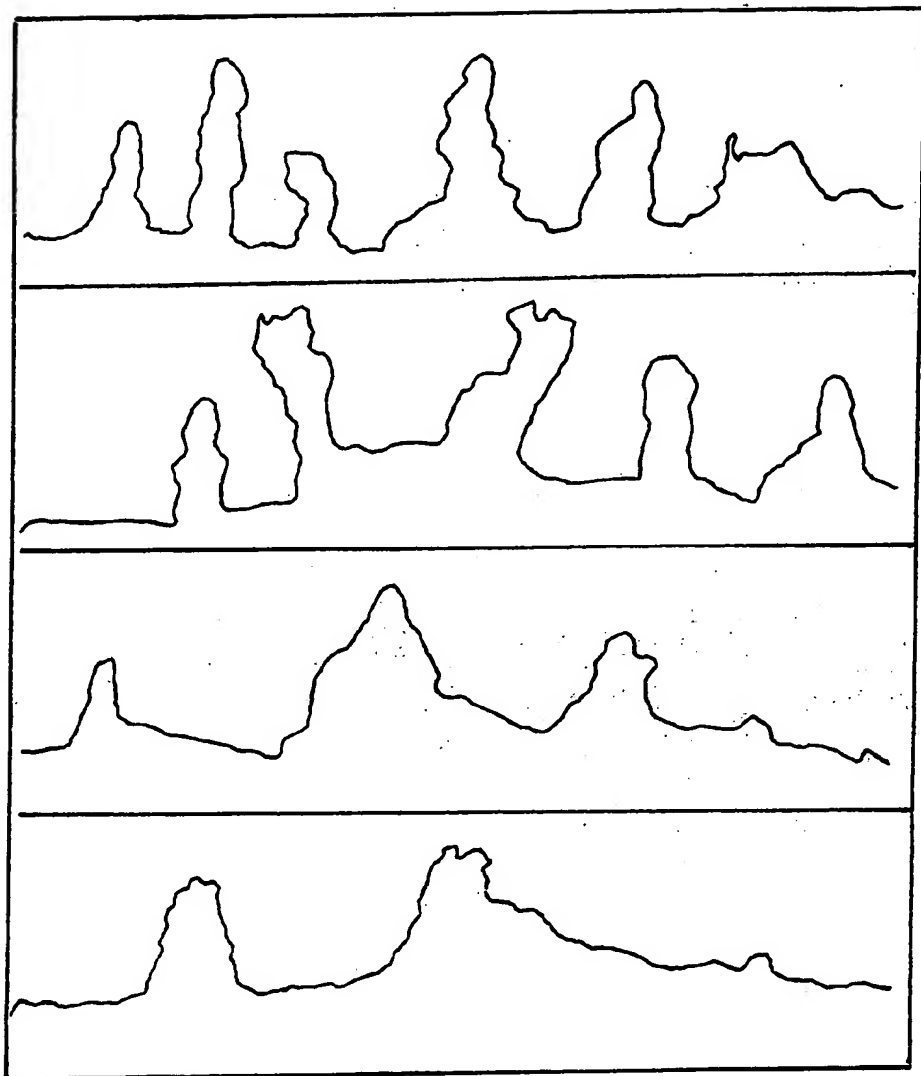


FIG.3.

REAL FLAME EFFECTS IN ELECTRIC FIRES

This invention relates to apparatus or component assemblies which are intended, by generating visual and audio effects, to evoke real flame sensations in electric fires and similiar heaters. For many years the marketplace has been supplied with "living flame" heaters where the illulSION of flickering flames was generated by arranging that lightweight aluminium turbine blades rotate in the hot raising air from one or more red coloured electric lamps and thereby interrupt the coloured light with the radial arms of the rudimentary turbine so that such light falling upon an aluminium reflector evokes the visual sensation of flame flicker. In addition to this simple system the prior art as taught in G3.1,266,131 illustrates the use of projection methods of flame simulation using S.m.m. cine projections from a continuous loop of coloured film, or the use of cathode ray tubes to directly or indirectly view colour images of flames generated in the phosphor of the tube by means of an undescribed "associated apparatus". Little else is to be found in the prior art so there is a need for an apparatus or component assembly that will be capable of simulating on a screen, within the electric fire structure, both an audio and visual effect which will evoke the sensation of a real flame effect fire. According to the present invention there is provided a means of generating the audio and visual effects necessary to simulate the aura associated with flames and fire by employing opaque or semi-opaque screens onto which are pro-

jected one or more flame image sequences which have been previously recorded in real life and thereafter stored on video tape with sound effects and regenerated continuously on the fire screen or screens by means of a video player, colour monitor and lens or mirror optical system.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:-

Figure 1 is a side sectional elevation of a three element electric fire with a single-opaque screen back-projection video flame image employing a video player and a colour monitor.

Figure 2 is a side sectional elevation of the electric fire of Figure 1 but employing four semi-opaque plastic projection screens in order to achieve an overall space orientated 3-D effect.

Referring to the drawings the real flame effect electric fire comprises a conventional 3-bar element and guard structure 1 with a fibre glass/resin moulded coal or wood simulation cover 2 which is abutted at right angles to an opaque plastic projection screen 3. Within the frame or housing 4 of the fire there are fixed component assemblies in the form of a VHS video player 5, a colour VDU or monitor 6, a focusing lens 7 and a plane mirror 8. Because these units are intended to operate as close to ambient temperature as possible the fire enclosure is equipped with an air circulation fan 9 which expells air from the enclosure in the direction of the arrows 10. In order to achieve a 3-D effect using the technique of back-project-

ion it is necessary to employ four or more separate "flame" videos which are combined onto one image using image processing technology as used at present in the professional TV studio and when this is done the image of Figure 3 is obtained which is a composite four plane image. The actual fire system associated with this technique comprises the usual element/guard structure 1 with its fuel simulation cover 2 and frame housing 4 but in this case the video player 5, the colour VDU 6 and the focusing lens 7 are associated with a series of four semi-opaque back-projection screens 11, 12, 13 and 14 which are separately served by angled positioned plane mirrors 15, 16, 17 and 18. As before the electric fire enclosure 4 is ventilated by means of the fan 9. In the operation of this invention there are no problems associated with opaque projection screens but it is not so simple to evolve a screen which could be described as semi-opaque. In early experiments I successfully employed the old principle of Bunsen's Grease Spot Photometer and used sheets of cartridge paper which were rendered translucent by soaking them with a small quantity of non-oxidising oil such as Light Liquid Paraffin of the British Pharmaceutical Coded(1963). In the final versions of the semi-opaque plastic projection screen the required surface was produced in one case by covering it with an array of opaque dots of about 1mm diameter which was obtained by silk-screen printing with a thickened solvent solution onto the translucent sheet and in another case by masking the sheet with a 1mm circular grid and blasting the grid with a fine grade of aluminium oxide abrasive. It will be apparent to those skilled in the

art that this invention has further potential for development and in addition to the already claimed video and audio reproduction of fuel combustion, in the domestic grate, it is possible to even arrange for the real flame electric fire to evolve, from a time controlled aerosol, the odours of pine needles, eucalyptus or wood tars which would add to the video/audio part the final sensation of the smell of a log fire.

CLAIMS

- 1).Real flame effects in electric fires are provided by generating the audio and visual effects necessary to simulate the aura associated with flames and fire by employing opaque,or semi-opaque,screensonto which can be projected one or more flame image sequences which have been previously recorded in real life and thereafter stored on video tape,with sound effects,and regenerated continuously on the fire screen,or screens,by means of a video player,colour monitor and lens or mirror optical system.
- 2).Real flame effects in electric fires are produced by the techniques of the Claim 1 wherein one opaque projection screen is used to visually realise the flames simulation and the video recorder the audio simulation.
- 3).Real flame effects in electric fires are produced by the techniques of the Claim 1 wherein a 3D-effect is simulated by the use of four semi-opaque back projection screens which are separately served by angled positioned plane mirrors.
- 4).Real flame effects in electric fires are provided by the techniques of Claims 1 and 3 wherein the semi-opaque screens are produced by covering translucent polymer sheets with a uniform array of opaque dots using paints or pigment inks in a silk screen printing process.
- 5).Real flame effects in electric fires are provided by the techniques of Claims

1 and 3 wherein the semi-opaque screens are produced by masking a translucent polymer sheet with a circular grid of appropriate size and thereafter blasting the grid/sheet with fine grade abrasive particles.

6).Real flame effects in electric fires are provided by the techniques of any of the above Claims wherein the video and audio effects are further augmented by the provision of a timed controlled release of aerosol packed fragrances of pine needles,eucalypyus or wood tar to impart the olfactory sensation of log burning.

Amendments to the claims have been filed as follows

1. Real flame effects in electric fires are provided by generating the audio and visual effects necessary to simulate the aura associated with flames and fire by employing opaque, or semi-opaque, screens onto which can be projected one or more flame image sequences which have been previously recorded in real life and thereafter stored on video tape, with sound effects, and regenerated continuously on the fire screen, or screens, by means of a video player, colour monitor and a lens or mirror optical system.

2. Real flame effects in electric fires are produced by the techniques of Claim 1 wherein one opaque projection screen is used to visually realise the flame simulation and the video recorder the audio simulation.

3. Real flame effects in electric fires are produced by the techniques described in Claim 1 wherein a 3D-effect is produced by the use of four or more semi-opaque back-projection screens which are separately served by angled positioned plane mirrors but where four or more separate flame video recordings are combined into one image using image processing technology to yield a composite four, or more, plane image.

4. Real flame effects in electric fires are provided by the techniques of Claims 1 and 3 wherein the semi-opaque screens are produced by covering translucent polymer sheets with a uniform array of opaque dots using paints or pigment inks in a silk screen printing process.

5. Real flame effects in electric fires are provided by the techniques of Claims 1 and 3 wherein the semi-opaque screens are produced by masking a translucent polymer sheet with a circular grid of appropriate size and thereafter blasting the grid/sheet with fine grade abrasive particles.
6. Real flame effects in electric fires are provided by the techniques of any of the above Claims wherein the video and audio effects are further augmented by the provision of a timed controlled release of aerosol packaged fragrances of pine needles, eucalyptus or wood tar to impart the olfactory sensation of burning logs.
7. Real flame effects in electric fires substantially as herein described with reference to Figures 1 to 3 of the accompanying drawing.

Patents Act 1977**Examiner's report to the Comptroller under Section 17 .9 -
(The Search report)**Application number
GB 9406339.3**Relevant Technical Fields**

- (i) UK Cl (Ed.N) F4W (W57); G5C (CAC, CAD, CDBF)
(ii) Int Cl (Ed.6) F24C; G09F

Search Examiner
R A H CASLINGDate of completion of Search
9 MAY 1995**Databases (see below)**

- (i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant
following a search in respect of
Claims :-
1-6

- (ii) ONLINE: WPI

Categories of documents

- X: Document indicating lack of novelty or of inventive step. P: Document published on or after the declared priority date but before the filing date of the present application.
- Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A: Document indicating technological background and/or state of the art. &: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
A	GB 2242737 A (SHUTE) see whole document	1 at least
A/X	GB 1266131 (LONG) see page 1 line 85 et seq page 2 lines 15-17, and page 2 line 81 et seq	1, 2 at least

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).